



# Audit

# Report



OFFICE OF THE INSPECTOR GENERAL

**UNIT PRICING BY THE SINGLE MANAGER FOR  
CONVENTIONAL AMMUNITION**

Report No. 93-025

November 19, 1992

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**93-23953**



**Department of Defense**

The following acronyms are used in this report.

AMCCOM.....U.S. Army Armament, Munitions and Chemical Command  
Charter..Charter for Conventional Ammunition Working Capital Fund  
CAWCF.....Conventional Ammunition Working Capital Fund  
SMCA.....Single Manager for Conventional Ammunition



**INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
400 ARMY NAVY DRIVE  
ARLINGTON, VIRGINIA 22202-2884**



November 19, 1992

**MEMORANDUM FOR ASSISTANT SECRETARY OF THE NAVY (FINANCIAL  
MANAGEMENT)  
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL  
MANAGEMENT AND COMPTROLLER)  
COMPTROLLER OF THE DEPARTMENT OF DEFENSE  
INSPECTOR GENERAL, DEPARTMENT OF THE ARMY**

**SUBJECT: Audit Report on Unit Pricing by the Single Manager  
for Conventional Ammunition (Report No. 93-025)**

We are providing this final report for your information and comments. This is the first of two reports on the procedures used by the single manager to purchase and price conventional ammunition for DoD. This report resulted from our expanded review on the "Audit of Procurement Procedures Used by the Single Manager for Conventional Ammunition" and addresses the pricing methodology used by the Single Manager for Conventional Ammunition.

DoD Directive 7650.3 requires that all audit recommendations be resolved promptly. A draft of this report was provided to management for comments, and comments were not received as of the report date. Therefore, we request that the Commander, U.S. Army Armament, Munitions and Chemical Command provide comments on the findings, recommendations, and potential monetary benefits by January 19, 1993. The directive also requires that comments indicate concurrence or nonconcurrence in the finding and each recommendation addressed to you. If you concur, describe the corrective actions taken or planned, the completion dates for actions already taken, and the estimated dates for completion of planned actions. If you nonconcur, you must state your specific reasons for each nonconcurrence. If appropriate, you may propose alternative methods for accomplishing desired improvements. If you nonconcur with the estimated monetary benefits or any part thereof, you must state the amount with which you nonconcur and the basis for your nonconcurrence. Recommendations are subject to resolution in the event of nonconcurrence or failure to comment.

We appreciate the cooperation and courtesies extended to the audit staff. If you have any questions on this audit, please

contact Ms. Bobbie Sau Wan at (703) 692-3013 (DSN 222-3013) or Mr. Richard Jolliffe at (703) 692-2999 (DSN 222-2999). The planned distribution of this report is listed in Appendix H.

*Robert J. Lieberman*

Robert J. Lieberman  
Assistant Inspector General  
for Auditing

cc:

Secretary of the Army

Secretary of the Navy

secretary of the Air Force

Assistant Secretary of Defense (Production and Logistics)

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Office of the Inspector General, DoD

AUDIT REPORT NO. 93-025  
(Project No. 1CA-0046.01)

November 19, 1992

UNIT PRICING BY THE SINGLE MANAGER FOR CONVENTIONAL AMMUNITION

EXECUTIVE SUMMARY

**Introduction.** Each year the U.S. Government buys large amounts of conventional ammunition. In FY 1990, customers placed orders valued at \$2.8 billion. Typical examples of conventional ammunition are bombs dropped from airplanes and cartridges fired in mortars, howitzers, rifles or pistols. Since many of the manufacturing processes and components are the same for conventional ammunition used by all Military Departments, DoD established the Conventional Ammunition Working Capital Fund effective October 1, 1981, to facilitate and standardize procurement. DoD created a Charter for the Conventional Ammunition Working Capital Fund and designated the U.S. Army Armament, Munitions and Chemical Command, Rock Island, Illinois, as the Single Manager for Conventional Ammunition. On June 1 of each year, the single manager is responsible for establishing standard prices for Military Departments to purchase conventional ammunition for the following fiscal year.

**Objectives.** The objectives of this audit were to:

- o determine whether procurement practices and procedures were proper and effective,
- o evaluate whether the single manager adequately determines that items were purchased at fair and reasonable prices, and
- o determine the effectiveness of applicable internal controls.

After the survey phase, we added an objective to evaluate the accuracy of the unit prices established and managed by the single manager. We also performed steps to determine the validity of concerns expressed by the U.S. Marine Corps regarding its acquisition of mortar ammunition through the Conventional Ammunition Working Capital Fund, from which they had been billed repeatedly for price increases. This report addresses unit pricing and internal controls. We will issue a second report that addresses procurement procedures.

**Audit Results.** The audit showed that price increases charged to the U.S. Marine Corps for mortar ammunition orders were consistent with appropriate pricing policy for full recoupment of costs on nonstandard priced orders. See "Other Matters of Interest" in Part I for details.

The single manager did not consistently develop standard prices that accurately estimated actual costs, as required by the Charter. As a result, costs were not allocated fairly among customers. See the finding in Part II for details.

**Internal controls.** Internal controls were not properly established to ensure customer unit prices were standardized to accurately estimate actual costs in accordance with the Charter policy. See the finding for details on this material internal control weakness and page 3 for details of our review of internal controls.

**Potential Benefits of Audit.** The audit showed that the single manager could have reduced mispricing of \$204.4 million for the 1990 fiscal year to the Military Departments by including all relevant information in the standard unit prices (see Appendix F). If the budget for ammunition remains similar to the period reviewed, the Services can reduce the requested amount by an estimated \$105 million in FY 1994 by implementing the recommendations in this report.

**Summary of Recommendations.** We recommended that the Single Manager for Conventional Ammunition revise local pricing policies and procedures and establish controls to implement pricing policies in conformance with its Charter. The report recommendations would result in uniform prices for like items and increased pricing accuracy.

**Management Comments.** The Commander of U.S. Army Armament, Munitions and Chemical Command did not provide written comments to the draft of this report. We request that the Commander comment on the recommendations by January 19, 1993.

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This report was prepared by the Contract Management Directorate, Office of the Assistant Inspector General for Auditing, DoD. Copies of the report can be obtained from the Secondary Reports Distribution Unit, Audit Planning and Technical Support Directorate, (703) 614-6303 (DSN 224-6303).

## **PART I - INTRODUCTION**

### **Background**

**Charter and fund.** Conventional ammunition items, such as bombs dropped from airplanes and cartridges fired in mortars, howitzers, rifles, and pistols have multiple DoD users. A large number of these items share common components and materials, as well as contractors, labor, and facilities used in the manufacturing process. To take advantage of the common characteristics, the "Charter for the Conventional Ammunition Working Capital Fund" (Charter) established the Conventional Ammunition Working Capital Fund (CAWCF) to facilitate and standardize conventional ammunition procurement. The charter was approved on April 1, 1985.

The CAWCF, which is an operating entity used to buy conventional ammunition for authorized customers from contractors who perform the manufacturing processes, is a working capital fund that operates on a break-even basis. The CAWCF requires that initial order prices be prepared about 1 1/2 years before the customer places orders so that the customers can include the pricing in its budget submission to the President. The initial order price is updated continuously until the standard price is set on June 1 prior to the funding year. All production and procurement of material is paid for by the CAWCF for its customers on a reimbursable basis. Obligations based on anticipated orders are unauthorized.

**Single manager for conventional ammunition.** The Charter delegated the U.S. Army Material Command as the Single Manager for Conventional Ammunition (SMCA) with primary responsibility to administer and manage the CAWCF. However, day-to-day operations of the CAWCF are delegated to the U.S. Army Armament, Munitions and Chemical Command (AMCCOM), Rock Island Arsenal, Illinois.

**Standard pricing.** The Charter requires standard pricing within the CAWCF to establish uniform prices for like conventional ammunition items in regular production. Standard pricing consists of accurately estimating production cost and volume, and then determines unit costs that will be used uniformly in pricing like items for customer orders.

### **Objectives**

The objectives of this audit were to:

- o determine whether procurement practices and procedures were proper and effective,

- o evaluate whether the SMCA adequately determined that items were purchased at fair and reasonable prices,

- o determine the effectiveness of applicable internal controls, and

- o evaluate the accuracy of the unit prices established and managed by the SMCA.

### Scope

This report is limited to our audit of the SMCA unit pricing methodology and practices, as well as associated internal controls. We also performed an audit of the procurement procedures SMCA used and the results of that audit were reported in a draft report issued October 22, 1992, under Project No. 1CA-0046. That report addressed the first and second audit objectives.

Universe and sample. The unit pricing audit was performed at AMCCOM. At our request, the Finance and Accounting Division, Office of the Comptroller, AMCCOM provided a computer generated listing of the universe of 209 FY 1990 customer orders valued at \$2.6 billion. We relied only on this computer generated data and did not include orders for less than \$1 million in the universe. From the universe, we statistically selected a sample of 43 orders valued at \$1.2 billion (46 percent) to use in evaluating the audit objectives. We eliminated four of the sample orders valued at \$167.7 million because they were not managed by the CAWCF or they were classified. See Appendix A for a listing of the sample. Nothing came to our attention as a result of audit procedures that caused us to doubt the reliability of the computer generated data. The universe and statistical projections are discussed in detail in Appendix C.

The audit reviewed documentation from December 3, 1980, through May 12, 1992, which we used as the basis for establishing the standard price for each sample item reviewed. We also interviewed pricing analysts, supervisors, and other personnel responsible for establishing and reviewing standard prices. In addition, we reviewed written policies and procedures.

Use of technical staff. The Office of the Assistant Inspector General for Auditing statistician assisted in the performance of the audit by making a stratified sample selection of pricing actions and in interpreting the results.

Audit period, standards, and locations. This economy and efficiency audit was performed between June 1991 and April 1992

and was made in accordance with auditing standards issued by the Comptroller General of the United States as implemented by the Inspector General, DoD. Accordingly, the audit included such tests of internal controls as were considered necessary. The activities visited or contacted are listed in Appendix G.

### Internal Controls

Controls assessed. We reviewed internal controls related to establishing base prices, escalation calculations, and standard prices.

Internal control weaknesses. The audit identified a material internal control weakness as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38. Internal controls were not effective in ensuring consistently accurate standard prices in accordance with the Charter. In our opinion, the CAWCF was not in full compliance with Army Regulation 11-2, "Internal Management Control." Army Regulation 11-2 is the Army's implementation of the Federal Managers' Financial Integrity Act, Public Law 97-255; Office of Management and Budget Circular A-123 on Internal Control Systems; and DoD Directive 5010.38, "Internal Management Control Program." Recommendations 1. and 2. in this report, if implemented, should correct this weakness. We determined that the Military Departments can realize monetary benefits of about \$105 million if the SMCA implements Recommendation 2. A copy of the final report will be provided to the senior official responsible for internal controls within the Army.

### Prior Audits and Other Reviews

Office of the Inspector General, DoD, Audit Report No. 87-056, "Pricing and Billing of Howitzers for Foreign Military Sales," December 5, 1986, stated that AMCCOM had not established a recoupment rate for nonrecurring costs for the 105 MM towed howitzer. As a result, \$257,000 of cost had not been recovered from prior sales, and \$411,000 of projected costs might not be recovered. The Assistant Secretary of the Army (Financial Management) concurred with the recommendation and submitted a nonrecurring cost recoupment rate for the howitzer to the Defense Security Assistance Agency for approval.

AMCCOM Report No. 42-89, "Review of Selected Marine Corps MIPRS [Military Interdepartmental Purchase Request(s)]," September 29, 1989, disclosed that price increases were adequately supported for 60 MM and 81 MM mortar ammunition. Problems, however, were identified in the budget formulation process and price quotes prepared on behalf of customers. Representatives of the Production Directorate at AMCCOM concurred with the Internal

Review findings. Internal Review Follow-up Report No. 90-08(D) concluded that adequate corrective action had been implemented to correct reported deficiencies.

U.S. Army Materiel Command Independent Review Report, "Marine Corps Mortar Ammunition Program," December 11, 1990, disclosed that an audit trail was not maintained to track engineering support in production estimates to those costs finalized and furnished to the customer. The report does not state whether representatives of AMCCOM concurred with the findings. No follow-up review was performed; however, the CAWCF procedures for applying engineering support in production estimates changed from individual order dollar estimates to standard engineering support in production factors. This change eliminated the need for individual order engineering support in production audit trails.

General Accounting Office, Report No. NSIAD-91-276, (OSD Case No. 8747), "Potential Adjustments to Ammunition Programs," September 12, 1991, found that the Army's request of \$31.4 million in FY 1992 for 39,000 units of 120 MM M831 tank training cartridges was overstated because increased production efficiency was not taken into account in the budgeting process. Army officials agreed that the costs for the M831 cartridges would decrease; however, they stated that the Army could not take advantage of the cost reductions for FY 1992 because the standard price system used would not permit a price change until the next budget review.

The report further stated that the Marine Corps overstated its request for 6.9 million units of 40 MM M430 cartridges, valued at \$88.1 million for FY 1992, by \$43.7 million. This overstatement occurred because only half of the requested quantities were scheduled for production within the FY 1992 funded delivery period. Marine Corps officials concurred with the finding.

#### Other Matters of Interest

At the request of the Marine Corps, we reviewed its acquisition of 81 MM practice and 60 MM illumination mortar ammunition through the CAWCF. At the time of the review, the 81 MM practice and 60 MM illumination mortars were classified as nonstandard items. The Marine Corps questioned the propriety of price increases requested by the CAWCF. AMCCOM performed a review and on September 29, 1989, issued a report, which stated that the price increases for the mortar rounds were supportable. Despite the report, the Marine Corps did not believe that problems with the management of the program had been adequately addressed. The Marine Corps questioned price increases totaling approximately 21 percent for each of the two programs as follows:

o From February 8, through May 11, 1989, SMCA requested additional funds, which totaled \$1.7 million for procurement of 81 MM practice mortar rounds.

o From September 27, through October 18, 1988, SMCA requested additional funds, which totaled \$3.8 million for procurement of 60 MM illumination mortar rounds.

Our audit supports the Army conclusion that price increases for the mortar rounds were reasonable. Those price increases were also consistent with the pricing policy for full recoupment of costs on nonstandard priced orders. Moreover, both mortar rounds were reclassified as standard priced in FY 1992. Standard pricing of those items will contribute to an efficient customer order process and will not require repeated requests to the customer for additional funding.

## PART II - FINDING AND RECOMMENDATIONS

### UNIT PRICING FOR CONVENTIONAL AMMUNITION

The SMCA did not consistently develop standard prices that accurately estimated actual costs for customer orders, as required by the Charter. This inconsistency occurred because the SMCA applied operating policies and procedures that conflicted with the Charter, established prices that did not consider all costs, and failed to establish procedures to verify that standard prices accurately estimated DoD costs of procuring conventional ammunition. As a result, prices for conventional ammunition were inaccurate, and all costs were not accurately determined for, or allocated fairly among, customers. Therefore, customer orders for conventional ammunition were overpriced by \$105 million (net) for FY 1990.

### DISCUSSION OF DETAILS

#### Background

The Charter requires that the SMCA ". . . establish standard prices on June 1 based on a best estimate of acquisition cost for the following fiscal year's execution (October 1 through September 30)." The Charter also states, "The standard price in effect at the time an order was accepted would normally be used throughout the life of that order." Further, DoD Directive 5160.65, "Single Manager for Conventional Ammunition," provides that the standard price for the current year will be used when a funded customer order is received prior to August 1 of that year. Any funded orders received on or after August 1 are to be priced using the standard price of the following year. For example, funded orders received between August 1, 1991, and July 31, 1992, (inclusive) should be priced using standard prices for FY 1992. The Charter requires that prices be estimated for the 2 years prior to the execution year. Hence, the estimated price may serve as an initial order price. The Charter provides that until a standard price is set, this initial order price is subject to revision.

According to the Charter, prices would include direct charges (costs identifiable to a specific end item such as direct labor, components, and materials) and surcharges (production engineering, quality assurance, proof and acceptance, and CAWCF gain or loss carried forward from previous fiscal years). The gain or loss surcharge applied in future periods is intended to recover any current CAWCF deficit or return any CAWCF surplus. However, this surcharge may not equitably correct the effects of mispricing since it is applied to a new customer base. Thus, a

Military Department whose order is overpriced in the current year will not recover excess costs paid to the CAWCF unless it places a future order of the same amount. This mispricing can result in one Military Department subsidizing the requirements of another Military Department.

### Customer Order Pricing

The audit of 39 customer orders, valued at \$1 billion, showed that the SMCA did not consistently develop accurate prices for customer orders as required by the Charter. We compared actual costs with initial order prices for the 39 orders reviewed and found that the actual cost of 10 of the 39 orders varied by 20 percent or greater from the initial price (5 orders were underpriced and 5 were overpriced) (see Appendix B). Based on our sample, we projected that for FY 1990, orders overpriced or underpriced by 20 percent or greater, totaled \$154.7 million and \$49.7 million, respectively (see Appendix C).

The combined effect of the orders mispriced by 20 percent or greater was a total mispricing amount of \$204.4 million (\$154.7 million plus \$49.7 million) and a net overpricing amount of \$105 million (\$154.7 million less \$49.7 million).

Ammunition item prices were neither accurate nor standard because the SMCA established internal policies that conflicted with the Charter, the CAWCF charged different prices for the same component, items were priced for the year of funding instead of the year of production, the pricing methodology did not consider all relevant data, and adequate written policies and procedures did not exist to provide guidance to personnel responsible for formulating initial prices. Also, initial order prices sampled were established as the standard price and generally without revision. For a list of initial order prices and standard prices for sampled orders, see Appendix D.

Conventional ammunition working capital fund charter. Internal policies established and implemented within the CAWCF were in conflict with the Charter. The audit identified two major areas where inconsistencies were evident.

**Standard pricing.** The Charter states that the CAWCF must set its standard prices on June 1 for execution in the following fiscal year. The Charter further states, "For planning, programming, and budgeting purposes, estimated prices for the two succeeding years . . . shall also be provided with the standard price list for the execution year." AMCCOM, Production Directorate Policy Statement No. 64, "Procedures for Implementing the Fund Standard Price Program Execution," implemented policies that established all estimated prices as

standard prices, except items newly transitioned to the SMCA. Thus, all variances between the initial estimated order prices established 2 years prior and the actual prices were to be absorbed by the CAWCF and ultimately passed on to future customers through CAWCF surcharges.

Establishing initial estimated order prices as standard prices is not in conformance with the Charter policy of allowing revisions to initial order prices before establishing the standard prices on June 1 prior to the execution year. This AMCCOM pricing policy allows the SMCA to escape accountability for inaccurately estimating initial order prices. The customers are generally unaware of inaccurate initial pricing because the resulting variances are passed along as surcharges to future customers. In effect, the CAWCF avoided the need to account for inaccurate pricing to its customers. Under the pricing policy mandated by the Charter, the CAWCF would be required to charge or refund initial pricing variances.

**Standard price changes.** The Charter allows an item price adjustment at the end of the first year of production if a cost analysis indicates that the actual cost of an individual order varies from the standard price by more than 10 percent or \$1 million. However, AMCCOM, Production Directorate Policy No. 64 requires that order prices not be adjusted when the variance is less than 20 percent or \$5 million, and therefore conflicts with the Charter policy. Thus, current operating policy permits a lower level of accuracy than that mandated by the Charter.

**Different prices for same component.** Standard pricing was neither standard nor accurate. Army Regulation 37-60, "Pricing for Materiel and Services," states "Standard pricing will promote uniformity and accuracy. . . . Each item will have a single standard price [and] this price will be used for inventory valuation and sales." The CAWCF charged different prices for the same component used in developing initial and subsequent standard prices. We reviewed component prices for 33 of the 39 sample orders. We did not review six orders because the items procured were still in the developmental stage and pricing was based on actual costs. There were 45 different components in the 33 orders, and 23 of these components were used in the pricing of 2 or more orders. Our review showed that AMCCOM had priced 15 of the 23 components inconsistently (see Appendix E).

**Work in funding year.** Our review disclosed that the CAWCF consistently mispriced customer orders by ignoring the effects of inflation on orders produced in years after the funding year. CAWCF procedures for establishing standard prices erroneously assumed that customer order production would occur entirely in

the funding year. However, the review disclosed that most or all of this production occurred in years subsequent to the funding year. This fact was readily known to the estimators. Customer orders funded for fiscal years 1988, 1989, and 1990, and amounts left unfilled as of each fiscal year end, are summarized in the following table.

<b>SCHEDULE OF CUSTOMER ORDERS AND AMOUNTS UNFILLED BY FISCAL YEAR</b> <b>(Dollars in Billions)</b>				
<u>Fiscal Year</u>	<u>Total Customer Orders</u>	<u>Unfilled FY End 1988</u>	<u>Unfilled FY End 1989</u>	<u>Unfilled FY End 1990</u>
1988	\$3.0	\$3.0	\$2.1	\$1.2
1989	2.9	0	2.8	2.0
1990	2.8	0	0	2.6

As shown above, the vast majority of customer orders were produced in years after the funding year, yet the orders were priced as if production would occur in the year of funding. Therefore, the procedures used by the CAWCF in developing standard prices did not comply with the Charter's mandate that standard prices be based on a "best estimate of acquisition cost." In order to best estimate acquisition costs, the CAWCF should have incorporated the effects of outyear production in its standard prices.

**Relevant data.** CAWCF pricing practices did not generally consider relevant information such as contractor production capability, product improvement proposals, learning curves, trend analyses, engineering estimates, and quantity differentials. These factors could be reasonably expected to affect historical data, possibly rendering it obsolete. Instead, the CAWCF limited itself to considering only historical prices. Following are some examples.

In sample item 1 (CBU-87B/B Bombs), the initial order price was established using the procurement history without taking into account learning curves or other relevant information. According to the cognizant price analyst, the item was procured at a price significantly lower than assumed in the initial order price. This lower procurement cost was due, in part, to increased contractor learning and efficiency, which resulted in actual costs being lower than the initial order price by \$76.2 million.

In sample item 23 (30 MM helicopter gun ammunition), cost estimates for a product improvement plan were not included in the

initial order price. The cost of the product improvement plan caused actual costs to overrun the initial order price by 15 percent. Cognizant pricing analysts told us that information on product improvement plans was seldom communicated to pricing analysts in time to incorporate the reasonably estimable cost of this product improvement plan into the price.

In sample item 30 (105 MM tank ammunition), the actual cost was 43 percent greater than the initial order price. Four consecutive bankruptcies by four separate small businesses -- all contracted to procure one component item -- caused this overrun. Therefore, consideration should be given to incorporating pertinent data, such as contract risk factors, into the standard price development process.

In sample item 36 (20 MM MK16 gun ammunition), actual costs were 86 percent greater than the order price because the Government-Owned, Government-Operated plant in McAlister, Oklahoma, originally responsible for the item, did not have the expertise to effectively price or perform the work. The plant underestimated the cost of procuring the necessary material needed to produce this item. Subsequent to the initial pricing the plant was ineffective in procuring the required material, and cognizance over this order was assumed by Rock Island Arsenal. Additionally, actual engineering costs vastly exceeded the original estimate due to numerous first-article test failures.

In sample item 31 (155 MM howitzer ammunition propellants), the item was originally priced under the assumption that a major component needed for producing this item would be procured. The estimated acquisition cost for this component was included as part of the standard price charged to the customer. After the standard price was established, an available inventory of the component was identified from another buying command's terminated order. Although the terminating buying command had paid for this component as part of its termination costs, the CAWCF used these excess components as "no-cost" material in producing the sample item, rather than issuing a refund or credit to the terminating buying command. Thus, two different customers were charged for the same components. This resulted in actual costs of 53 percent less than the standard price for the sample item.

The customers must bear the adverse effects of CAWCF pricing inaccuracies. If a price varies significantly from actual cost, the order quantity may have to be adjusted to keep the same funding. As the customer presumably ordered the correct quantity initially, the adjustment probably adversely affects the customer. For any other unrecognized change or omission, the CAWCF computes an annual gain or loss surcharge allocable to all customers on a pro rata basis.

Written policies and procedures. Personnel responsible for establishing standard prices were not provided with comprehensive written desk procedures, policies, or other written reference materials from which to readily obtain authoritative guidance on establishing standard prices. Policy statements and memoranda regarding various pricing issues were distributed by first-line supervisors, who provided their interpretations of the collective guidance to their subordinates. Thus, no comprehensive standard written source of information existed to ensure that pricing analysts consistently applied effective standard pricing procedures.

### Conclusion

The CAWCF pricing methodology was not valid. For FY 1990 the CAWCF pricing methodology resulted in mispricing that totaled \$204.2 million (for orders mispriced by 20 percent or greater) and overpriced customer orders that totaled \$105 million (net). We were not able to identify these amounts with specific CAWCF customers because our sample was stratified according to dollar amount and not by customer. The CAWCF pricing objective should be to fully recover actual costs for each procured item. This amount should be the sum of all resources expended (material, labor, and indirect costs) from the origination date of the procurement to the production date. To do this, the fund must identify the resources and their required date. Instead, the CAWCF priced the FY 1990 orders as though the production would occur in FY 1990, despite the fact that almost all of the work would be performed in future years.

Although the variances, which were due to the CAWCF inaccurate pricing, are carried forward and applied to future orders through fund surcharges, this procedure does not mitigate the adverse effects borne by its customers. Military Departments must prepare their budgets based on the best projections available. If the CAWCF submits an inflated initial order price to a customer, then the customer, subject to budget constraints, may order a lesser quantity than optimally needed because of the inaccurate price. Conversely, an item that is underpriced may benefit the customer in the short run, but future customers must absorb the excess cost through the CAWCF surcharges.

AMCCOM, Production Directorate, Policy No. 64 allows the CAWCF to avoid accountability to its customers for inaccurate initial order prices submitted because, contrary to Charter policy, no revisions to the initial order prices are made. If the Charter policy were followed, the CAWCF would be required to disclose its pricing inaccuracies to each customer because the initial order price would be revised. Thus, the CAWCF would be directly accountable for accurately estimating its prices.

The pricing system at AMCCOM emphasized simplified arithmetic calculations and had no established standard prices that reflected all available information. Prices were normally the result of average historical costs escalated to future years. Prices were incorrectly computed and consistently inaccurate, and varied from order to order.

Standard pricing consists of accurately estimating production cost and volume and determining unit costs that will be used uniformly in pricing like items. Consideration should be given to production schedules, availability of resources, and realistic delivery schedules when computing standard prices. In addition, the standard prices should reflect all relevant data.

No comprehensive set of written guidance or instructions existed for pricing analysts for establishing standard prices. Although memoranda and policy statements were periodically distributed, pricing consistency was not ensured because applicable policies were subject to wide interpretation by pricing analysts and their first-line supervisors.

#### RECOMMENDATIONS, MANAGEMENT COMMENTS, AND AUDIT RESPONSE

We recommend that the Commander, U.S. Army Armament, Munitions and Chemical Command:

1. Revise the local pricing policy and practices to conform to the Charter and Army Regulation 37-60, "Pricing for Materiel and Services" by implementing the following:

- a. Establish initial order prices as nonstandard, subject to revision, until submitting them as standard prices on June 1 prior to the execution year, as mandated by the Charter.

- b. Allow standard price changes when actual costs for a customer order vary from the standard price by more than \$1 million or 10 percent, whichever is less.

- c. Evaluate all relevant data in developing initial order and subsequent standard prices so that full and appropriate costs can be recouped.

2. Establish comprehensive written desk procedures or instructions for personnel responsible for analyzing and establishing standard prices.

**Management Comments.** The Commander, U.S. Army Armament, Munitions and Chemical Command did not provide written comments to these recommendations.

**Audit Response.** We request that the Commander, U.S. Army Armament, Munitions and Chemical Command provide comments to the final report by January 19, 1993.

### PART III - ADDITIONAL INFORMATION

- APPENDIX A - Sample Items and Monetary Value
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# APPENDIX A - SAMPLE ITEMS AND MONETARY VALUE

<u>Sample Number</u>	<u>Procurement Request Order Number</u>	<u>Monetary Value</u>
1	U10M468104M1F1	\$ 212,504,580.00
2	A100407504M101	188,630,575.84
3	*	
4	A100407201M101	82,194,880.12
5	A100409702M101	70,027,290.45
6	R10M433405M1F1	43,370,048.16
7	A100405204M101	39,791,817.00
8	T10M444602M1F1	38,006,354.40
9	A10EF5005925M1	37,296,000.00
10	A10EG401D109F1	35,544,587.00
11	A1004081M02101	32,999,946.21
12	A1095028M02101	29,906,666.56
13	A1004079M03101	28,999,987.78
14	A1091012M02101	28,333,000.00
15	U10M473701M1F1	22,495,027.20
16	*	
17	*	
18	R10M429402M1F1	17,050,700.94
19	R10M468401M1F1	15,495,846.21
20	A100402002M101	15,026,760.00
21	R10W490002M1F1	11,522,100.00
22	T10M447302COF1	10,425,842.10
23	A100402701M101	10,026,847.60
24	T10M476503COF1	8,732,901.44
25	U10M416602M1F1	7,721,929.20
26	*	
27	T10M427001M1F1	5,673,855.66
28	T10M446001M1F1	5,590,899.60
29	A100408202M101	4,999,949.52
30	A100405104M103	3,317,515.50
31	T10M469001M1F1	2,817,617.60
32	WGOM486403M1F1	2,679,750.00
33	W10M403203M1F1	2,590,000.00
34	A107411202M101	2,551,077.90
35	W10M403801M1F1	2,400,000.00
36	R10M431602M1F1	2,034,760.00
37	U10M440001M1F1	1,997,780.00
38	A100406302M101	1,787,992.40
39	U10M467801M1F1	1,702,880.00
40	U10M469303M1F1	1,679,729.10
41	W10M409901M1F1	1,614,608.64
42	T10M440302M1F1	1,469,413.66
43	T10M448703M1F1	1,123,637.46
Total		<u>\$1,032,135,155.25</u>

\* Sample orders that were not managed by the fund or were classified.

**APPENDIX B - ACTUAL VERSUS INITIAL PRICE FOR SAMPLE ITEMS**

Sample Number	Procurement Request Order Number	Original Unit Quantity	Initial Order Price	Actual Unit Price	Unit Variance	Absolute Value		Percent Variance	Variance		Variance Actual Over Original	Variance Actual Under Original
						Total	Variance					
1	U10M468104M1F1	18,000	\$15,304.28	\$11,072.09	\$(4,232.19)	\$76,179,420.00		-27.65				\$(76,179,420.00)
2	A100407504M101	240,257	780.13	718.86	(61.27)	14,720,546.39		-7.85				(14,720,546.39)
3	4A0AP07U1AF1											
4	A100407201M101	18,028	4,559.29	4,391.08	(168.21)	3,032,489.88		-3.69				(3,032,489.88)
5	A100409702M101	82,485	848.97	828.34	(20.63)	1,701,665.55		-2.43				(1,701,665.55)
6	R10M433405M1F1	74,736	580.31	488.25	(92.06)	6,880,196.16		-15.86				(6,880,196.16)
7	A100405204M101	251,100	158.47	169.46	10.99	2,759,589.00		6.94		\$2,759,589.00		
8	T10M444602M1F1	257,880	147.38	162.62	15.24	3,930,091.20		10.34		3,930,091.20		
9	A10EF5005925M1	15,600,000	2.39	2.31	(0.08)	1,248,000.00		-3.35				(1,248,000.00)
10	A10EC401D109F1	126,710	273.03	275.59	2.56	324,377.60		0.94		324,377.60		
11	A1004081M02101	226,757	145.53	144.08	(1.45)	328,797.65		-1.00				(328,797.65)
12	A1095028M02101	2,741,215	10.91	11.78	0.87	2,384,857.92		7.97		2,384,857.92		
13	A1004079M03101	546,242	53.09	65.96	12.87	7,030,134.54		24.24		7,030,134.54		
14	A1091012M02101	97,700,000	.29	0.33	0.04	3,908,000.00		13.79		3,908,000.00		
15	U10M473701M1F1	1,495,680	15.04	12.83	(2.21)	3,305,452.80		-14.69				(3,305,452.80)
16	A1098114M101											
17	A1004122M101											
18	R10M429402M1F1	288,897	59.02	61.80	2.78	803,133.66		4.71		803,133.66		
19	R10M468401M1F1	63,531	243.91	226.24	(17.67)	1,122,592.77		-7.24				(1,122,592.77)
20	A100402002M101	4,174,100	3.60	3.76	0.16	667,856.00		4.44		667,856.00		
21	R10M490002M1F1	965,000	11.94	11.21	(0.73)	704,450.00		-6.11				(704,450.00)
22	T10M447302COF1	131,490	75.95	80.29	4.34	570,666.60		5.71		570,666.60		
23	A100402701M101	998,690	10.04	11.60	1.56	1,557,956.40		15.54		1,557,956.40		
24	T10M476503COF1	37,984	203.11	222.81	19.70	748,284.80		9.70		748,284.80		
25	U10M416602M1F1	28,920	286.50	288.30	1.80	52,056.00		0.63		52,056.00		
26	A1004115M101											
27	T10M427001M1F1	4,686	1,210.81	1,016.62	(194.19)	909,974.34		-16.04				(909,974.34)
28	T10M446001M1F1	106,392	52.55	42.66	(9.89)	1,052,216.88		-18.82				(1,052,216.88)
29	A100408202M101	53,902	122.56	83.44	(39.12)	2,108,646.24		-31.92				(2,108,646.24)
30	A100405101M103	23,790	139.45	198.44	58.99	1,403,372.10		42.30		1,403,372.10		

APPENDIX B - ACTUAL VERSUS INITIAL PRICE FOR SAMPLE ITEMS (cont'd)

Sample Number	Procurement Request Order Number	Original Unit Quantity	Initial Order Price	Actual Unit Price	Unit Variance	Absolute Value		Percent Variance	Variance		Variance Actual Over Original	Variance Actual Under Original
						Total	Variance		Total	Variance		
31	T10M469001M1F1	34,640	\$81.34	\$37.52	\$(43.82)	\$1,517,924.80		-53.87	\$1,517,924.80			\$(1,517,924.80)
32	WGOM486403M1F1	15,000	178.65	179.70	1.05	15,750.00		0.59	15,750.00		\$15,750.00	
33	W10M403203M1F1	7,000,000	0.26	0.33	0.07	490,000.00		26.92	490,000.00		490,000.00	
34	A107411202M101	18,466	147.80	148.13	0.33	6,093.78		0.22	6,093.78		6,093.78	
35	W10M403801M1F1	6,000,000	0.40	0.32	(0.08)	480,000.00		-20.00	480,000.00			(480,000.00)
36	R10M431602M1F1	195,650	10.40	19.40	9.00	1,760,850.00		86.54	1,760,850.00		1,760,850.00	
37	U10M440001M1F1	1,737,200	1.15	1.24	0.09	156,348.00		7.83	156,348.00		156,348.00	
38	A100406302M101	82,018	21.80	27.41	5.61	460,120.98		25.73	460,120.98		460,120.98	
39	U10M467801M1F1	1,468,000	1.16	1.27	0.11	161,480.00		9.48	161,480.00		161,480.00	
40	U10M469303M1F1	3,818	464.12	292.70	(171.42)	654,481.56		-36.93	654,481.56			(654,481.56)
41	W10M409901M1F1	25,056	65.81	73.80	7.99	200,197.44		12.14	200,197.44		200,197.44	
42	T10M440302M1F1	143	10,275.62	9,785.08	(490.54)	70,147.22		-4.77	70,147.22			(70,147.22)
43	T10M448703M1F1	111	10,122.86	11,242.44	1,119.58	124,273.38		11.06	124,273.38		124,273.38	
TOTALS						\$145,532,491.64		-	\$29,515,489.40		\$116,017,002.24	

**APPENDIX C - STATISTICAL PROJECTIONS SHOWING POINT PROJECTIONS,  
CONFIDENCE, AND PRECISION OF ESTIMATE**

<u>Finding</u>	<u>Projected Value of Finding</u>	<u>Precision With 90 Percent Confidence</u>
Total FY 1990 Value of Overpricing for Orders Overpriced by 20 Percent or Greater	\$154.7 Million	+/- \$37.6 Million
Total FY 1990 Value of Underpricing for Orders Underpriced by 20 Percent or Greater	\$49.7 Million	+/- \$12.1 Million

We reviewed 39 stratified (3 strata) sample orders, valued at \$1.0 billion, out of a universe of \$2.6 billion. The audit identified five sample orders overpriced by 20 percent or more. These overpriced sample items had overpricing totaling \$80.9 million. Additionally, the audit identified five sample orders underpriced by 20 percent or more. These underpriced sample items had underpricing totaling \$11.1 million. The sample overpricing and underpricing amounts were projected to the universe as shown above.

APPENDIX D - STANDARD VERSUS INITIAL PRICE FOR SAMPLE ITEMS

Sample Number	Procurement Request Order Number	Initial Price	Standard Price	Unit Variance	Quantity	Total Variance
1	U10M468104M1F1	\$15,304.28	\$11,805.81	\$ (3,498.47)	18,000	\$62,972,460.00
2	A100407504M101	780.13	780.13		240,257	
3	4A0AP0701AF1					
4	A100407201M101	4,559.29	4,559.29		18,028	
5	A100409702M101	848.97	848.97		82,485	
6	R10M433405M1F1	580.31	580.31		74,736	
7	A100405204M101	158.47	158.47		251,100	
8	T10M444602M1F1	147.38	147.38		257,880	
9	A10EF5000259M1	2.39	2.39		15,600,000	
10	A10EG40109D1F1	273.03	306.46	33.43	126,710	(4,235,915.30)
11	A100408102M101	145.53	145.53		226,757	
12	A109502802M101	10.91	10.91		2,741,216	
13	A100407903M101	53.09	53.09		546,242	
14	A109101202M101	0.29	0.29		97,700,000	
15	U10M473701M1F1	15.04	15.04		1,495,680	
16	A1096114M101					
17	A1004122M101					
18	R10M429402M1F1	59.02	59.02		288,897	
19	R10M468401M1F1	243.91	243.91		63,531	
20	A100402002M101	3.60	3.60		4,174,100	
21	R10W490002M1F1	11.94	11.94		965,000	
22	T10M447302COF1	75.95	79.29	3.34	131,490	(439,176.60)
23	A100402701M101	10.04	10.04		998,690	
24	T10M476503COF1	203.11	229.99	26.88	37,964	(1,020,472.32)
25	U10M416602M1F1	286.50	286.50		28,920	
26	A1004115M101					
27	T10M427001M1F1	1,210.81	1,210.81		4,686	
28	T10M446001M1F1	52.55	52.55		106,392	
29	A100408202M101	122.56	92.76	(29.80)	53,902	1,606,279.50
30	A100405101M103	139.45	139.45		23,790	

APPENDIX D - STANDARD VERSUS INITIAL PRICE FOR SAMPLE ITEMS (cont'd)

<u>Sample Number</u>	<u>Procurement Request Order Number</u>	<u>Initial Price</u>	<u>Standard Price</u>	<u>Unit Variance</u>	<u>Quantity</u>	<u>Total Variance</u>
31	T10M469001M1F1	\$81.34	\$81.34		\$34,640	
32	WG0M466403M1F1	178.65	178.65		15,000	
33	W10M403203M1F1	0.26	0.37	\$0.11	7,000,000	\$(770,000)
34	A107411202M101	147.80	147.80		16,466	
35	W10M403801M1F1	0.40	0.40		6,000,000	
36	R10M431602M1F1	10.40	10.40		195,650	
37	U10M440001M1F1	1.15	1.15		1,737,200	
38	A100406302M101	21.80	21.80		62,016	
39	U10M467801M1F1	1.16	1.16		1,466,000	
40	U10M469503M1F1	464.12	464.12		3,816	
41	W10M409901M1F1	65.81	64.44	(1.37)	25,056	34,326.72
42	T10M440302M1F1	10,275.62	10,275.62		143	
43	T10M448703M1F1	10,122.66	10,122.66		111	

**APPENDIX E - COMPONENTS WITH MORE THAN ONE UNIT PRICE**

<u>National Stock Number</u>	<u>Sample Number</u>	<u>Sample Unit Cost</u>	<u>Price Range*</u>	<u>Quantity</u>
1305007527815	14	\$0.0241	\$0.0021	99,654,000
1305007527815	33	0.0220		7,140,000
1305008922150A131	33	0.2810	0.0664	7,000,000
1305008922150A131	14	0.2146		97,700,000
1315000761434	16	0.2500	0.0833	70,000
1315000761434	08	0.1667		263,038
1315008612096	07	40.4337	16.6637	134,380
1315008612096	32	35.0215		15,150
1315008612096	07	34.0275		53,895
1315008612096	07	23.7700		65,663
1376000074875	41	2.5004	0.3424	38
1376000074875	28	2.1580		10
1376000074875	09	2.1580		4,368
1376000074875	02	2.1580		4,806
1376000074875	04	2.1580		46
1376007648065	41	1.9621	0.3077	1,404
1376007648065	12	1.6544		260,416
1376007648065	28	1.6544		9,225
1376007648065	02	1.6544		1,345,440
1376007648065	04	1.6544		35,068
1376007648065	09	1.6544		1,154,400
1376007877614	06	2.8695	0.0699	22,720
1376007877614	28	2.7996		160
1376007877614	12	2.7996		2,193
1376007877614	01	2.7996		18,000
1376008654003	41	8.3952	0.5279	113
1376008654003	04	7.8673		36
1376010491448	33	5.5024	0.3556	9,800
1376010491448	14	5.1468		83,320

**APPENDIX E - COMPONENTS WITH MORE THAN ONE UNIT PRICE (Cont'd)**

<u>National Stock Number</u>	<u>Sample Number</u>	<u>Sample Unit Cost</u>	<u>Price Range*</u>	<u>Quantity</u>
1376010491449	33	\$5.5024	\$0.3556	39,200
1376010491449	14	5.1468		547,106
1376010528502	11	6.0200	0.3659	62,359
1376010528502	31	5.6541		8,339
1376010528502	13	5.6541		131,481
1376010749321	28	16.1438	0.0118	213
1376010749321	01	16.1438		72
1376010749321	41	16.1320		8
3990000390223	18	57.5152	0.2007	116
3990000390223	21	57.3145		433
8140007390233	41	19.1989	2.1839	401
8140007390233	21	17.0534		10,250
8140007390233	06	17.0150		13,229
8140007390233	20	17.0150		42,576
8140009601699	18	5.7744	1.5442	15,613
8140009601699	37	4.2302		17,720
8140009601699	36	4.2302		38
8140009601699	28	4.2302		26,598

\*Price range is the difference between the highest and lowest sample unit cost for each National Stock Number.

**APPENDIX - SUMMARY OF POTENTIAL BENEFITS RESULTING FROM AUDIT**

<u>Recommendation Reference</u>	<u>Description of Benefit</u>	<u>Amount and Types of Benefits</u>
1.a. and 1.b	Internal Control. The Fund should conform to the Single Manager for Conventional Ammunition Charter and the Army Regulation 37-60, "Pricing for Materiel and Services" in its pricing policies to ensure compliance with the law.	Undeterminable. We were unable to quantify the monetary benefits because the disregard for the Charter and regulation negates the effectiveness of internal controls.
1.c.	Economy and Efficiency. All relevant data should be considered in deriving standard unit prices so that full and appropriate costs can be recouped.	\$105.0 million of funds put to better use during FY 1994.
2.	Internal Control. Comprehensive written procedures for pricing personnel should be developed to ensure price estimates are consistent and accurate.	Undeterminable. We were unable to quantify the monetary benefits due to the lack of comprehensive written procedures or instructions for establishing price estimates.

**APPENDIX G - ACTIVITIES VISITED OR CONTACTED**

**Department of the Army**

Headquarters, U.S. Army Materiel Command, Alexandria, VA  
U.S. Army Armament, Munitions and Chemical Command,  
Rock Island, IL  
U.S. Army Armament, Research and Development Center, Dover, NJ  
U.S. Army Audit Agency Resident Office, Rock Island, IL

**Department of the Navy**

Naval Air Systems Command, Arlington, VA  
Naval Sea Systems Command, Arlington, VA

**Department of the Air Force**

Deputy Chief of Staff Logistics, Arlington, VA  
Ogden Air Logistics Command, Hill Air Force Base, UT

**Non-DoD Federal Organizations**

General Accounting Office, Washington, DC

## APPENDIX H - REPORT DISTRIBUTION

### Office of the Secretary of Defense

Under Secretary of Defense for Acquisition  
Assistant Secretary of Defense (Production and Logistics)  
Director of Defense Procurement  
Comptroller of the Department of Defense

### Department of the Army

Secretary of the Army  
Inspector General, Department of the Army (Operations Division)  
Commander, Army Materiel Command  
Auditor General, Army Audit Agency

### Department of the Navy

Secretary of the Navy  
Assistant Secretary of the Navy (Financial Management)  
Auditor General, Naval Audit Service

### Department of the Air Force

Secretary of the Air Force  
Assistant Secretary of the Air Force (Financial Management and  
Comptroller)  
Auditor General, Air Force Audit Agency

### Defense Activities

Director, Defense Contract Audit Agency  
Director, Defense Logistics Agency  
Commander, Defense Contract Management Command

### Non-DoD Federal Organizations

Office of Management and Budget  
U.S. General Accounting Office, National Security and  
International Affairs Division, Technical Information Center

Chairman and Ranking Minority Member of the following  
Congressional Committees and Subcommittees:

Senate Subcommittee on Defense, Committee on Appropriations  
Senate Committee on Armed Services  
Senate Committee on Governmental Affairs  
House Committee on Appropriations,  
House Subcommittee on Defense, Committee on Appropriations  
House Committee on Armed Services  
House Committee on Government Operations  
House Subcommittee on Legislation and National Security,  
Committee on Government Operations

**AUDIT TEAM MEMBERS**

David K. Steensma, Director, Contract Management Directorate  
Richard B. Jolliffe, Audit Program Director  
Bobbie Sau Wan, Audit Project Manager  
John M. Young, Senior Auditor  
Marc A. Pederson, Senior Auditor  
Louis Max, Auditor  
Marc A. Zeid, Auditor  
Frank M. Ponti, Statistician  
Mable Randolph, Editor  
Velma L. Booker, Administrative Support